

Our ref: 113790:JHK:rw

Your ref:

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21 June 2005

IP Australia
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Dear Madam

International Patent Application PCT/AU2004/001678
Crocodile Corporation Ltd
"Tyre"

In response to the Written Opinion dated 6 January 2005, we enclose a Statement Under Article 34, together with new pages 3, 5, 10, 11 and 12.

The new pages incorporate amendments made to independent claims 1, 10 and 13 for the purpose of more clearly distinguishing the present invention from the references cited in the Written Opinion.

It is a particular feature of the present invention that the tyre comprises a band adapted to be releasably fixed with respect to the wheel rim by being welded thereto. Such an arrangement is not disclosed or suggested in either of the two documents cited in the Written Opinion.

Citation US 5,139,066 discloses a non-nematic tyre having an annular body of resilient construction (typically rubber) and a metal band encased in the annular body to provide reinforcement to the radially inner end portion of the tyre. With such an arrangement it is not possible for the band to be welded to the rim, as it is entirely encased within the rubber body. Accordingly, the document does not, in our view, disclose or otherwise suggest the tyre according to your invention.

Citation WO 2000/076789 discloses a non-nematic tyre comprising a radially inner portion in the form of a metal band and a body of resiliently flexible material supported on the band. The band is not adapted to be welded to the wheel rim.

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Having regard to the foregoing comments, we submit that the claims as amended now meet the prescribed requirements for novelty and inventive step.

Yours faithfully
WRAY & ASSOCIATES


John King

Enc: Statement Under Article 34
New pages 3, 5, 10, 11 and 12

radially inner portion engagable with the wheel rim to be supportingly received thereon, the radially inner portion comprising a band adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.

- The welding may comprise welding, such as stitch or spot welding, at 5 circumferentially spaced intervals around the band.

Preferably, the band comprises a rigid band of fixed diameter.

Conveniently, the rigid band comprises a metal band.

- The band may be welded to either one or both of the arcuate portions defining the outer periphery of the wheel rim. There is, however, an advantage in welding the 10 band only to the particular arcuate portion on the outer side of the wheel rim, as it would allow the tyre to be removed and replaced without the need to remove the wheel rim from the vehicle from which it is fitted.

- This fixing arrangement is advantageous, as it is simple yet highly effective. The fitting process simply involves positioning the tyre onto the wheel rim and then 15 welding the band thereto. For removal of the tyre, all that is necessary is to remove the welded bond, typically by grinding off the welds, and then withdraw the tyre from the rim. In this way, the tyre can be fitted and removed without the need for the services of an experienced tyre fitter. All that is required is access to welding equipment and an ability to weld.

- 20 It is believed that the welding would not damage the wheel rim to an extent that would preclude use of the wheel rim for its originally intended purpose of receiving a pneumatic tyre, should that be required at some later stage.

While welding is a particularly convenient and effective way of releasably fixing the tyre to the wheel rim, other ways of fixing are also possible, as alluded to

COMMONWEALTH OF AUSTRALIA*The Patents Act 1990*

IN THE MATTER of International
Patent Application
PCT/AU2004/001678.

Amendments Under Article 34**In The Claims**

Claims amended: 1, 2, 3, 10, 11, 13, 14

In The Description

Page 3 currently on file, lines 1 to 10 amended to reflect changes to claims 1, 2 and 3;

Page 5 currently on file, lines 3 to 18 amended to reflect changes to claims 10 and 13.

Comments

The amendments have been made in order to more clearly distinguish the present invention from cited prior art.

The amended claims are fully supported by the description, and no new matter has been introduced.

Dated this Twenty First day of June 2005.

a patent attorney of the firm
WRAY & ASSOCIATES,
patent attorneys for and on behalf of the applicant.

To the Commissioner of Patents,
Commonwealth of Australia.

an outer layer which is harder and more durable to provide good wear characteristics. The outer layer may also have the ability to be re-treaded.

According to a second aspect of the invention there is provided a combination of a wheel rim and a tyre, the wheel rim comprising a tyre support surface
5 incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, and the tyre comprising a radially inner portion engagable with the wheel rim to be supportingly received thereon, the radially inner portion comprising a band adapted to be releasably fixed with
10 respect to the outer periphery of the wheel rim by being welded thereto.

According to a third aspect of the invention there is provided a wheel rim and tyre assembly, wherein the wheel rim comprises a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the
15 outer periphery of the wheel rim, and wherein the tyre comprises a radially inner portion engaged with the wheel rim, the radially inner portion comprising a rigid band supportingly received on, and releasably fixed with respect to, the outer periphery of the wheel rim, the band being releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.

20 Whilst the invention as described hereinbefore has been concerned with non-pneumatic tyres, it could also be applicable to pneumatic tyres. For example, the cushioning structure provided on the rigid band may be pneumatic in construction.

Brief Description of the Drawings

The invention will be better understood by reference to the following description of
25 several specific embodiments thereof as shown in the accompanying drawings in which:

Figure 1 is a perspective view of a tyre according to a first embodiment of the invention;

The Claims Defining the Invention are as Follows

1. A tyre adapted to be fitted onto a wheel rim designed for pneumatic tyres, the wheel rim having a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, the tyre comprising a radially inner portion engagable with the wheel rim to be supportingly received thereon, the radially inner portion comprising a band adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.
- 10 2. A tyre according to claim 1 wherein the band comprises a rigid band of fixed diameter.
3. A tyre according to claim 2 wherein the rigid band comprises a metal band.
4. A tyre according to claim 1, 2 or 3 further comprising a cushioning structure provided on the band.
- 15 5. A tyre according to claim 4 wherein the cushioning structure comprises a resiliently deformable body bonded onto the band.
6. A tyre according to claim 5 wherein the resiliently deformable body incorporates a plurality of cavities separated by load-supporting walls.
7. A tyre according to claim 5 or 6 wherein the resiliently deformable body
20 comprises a unitary mass.
8. A tyre according to claim 5 or 6 wherein the resiliently deformable body is of composite construction comprising a plurality of layers of material having different characteristics.

9. A tyre according to claim 8 wherein the body comprises an inner layer of higher resilience for cushioning, and an outer layer which is harder and more durable to provide good wear characteristics.
10. A combination of a wheel rim and a tyre, the wheel rim comprising a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, and the tyre comprising a radially inner portion engagable with the wheel rim to be supportingly received thereon, the radially inner portion comprising a band adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.
5
11. A combination according to claim 10 wherein the band comprises a metal band of fixed diameter.
10
12. A combination according to claim 11 wherein the welding comprises welding at circumferentially spaced intervals around the band.
15
13. A wheel rim and tyre assembly, wherein the wheel rim comprises a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, and wherein the tyre comprises a radially inner portion engaged with the wheel rim, the radially inner portion comprising a rigid band supportingly received on, and releasably fixed with respect to, the outer periphery of the wheel rim, the band being releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.
20
14. A wheel rim and tyre assembly according to claim 13 wherein the band comprises a metal band of fixed diameter.
25
15. A wheel rim and tyre assembly according to claim 14 wherein the welding comprises welding at circumferentially spaced intervals around the band.
30

16. A tyre substantially as herein described with reference to the accompanying drawings.
17. A combination of a wheel rim and a tyre substantially as herein described with reference to the accompanying drawings.
- 5 18. A wheel rim and tyre assembly substantially as herein described with reference to the accompanying drawings.

The Claims Defining the Invention are as Follows

1. A tyre adapted to be fitted onto a wheel rim designed for pneumatic tyres, the wheel rim having a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, the tyre comprising a radially inner portion engagable with the wheel rim to be supportingly received thereon, the radially inner portion comprising a band adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto~~adapted to be supportingly received on~~, and ~~releasably fixed with respect to~~, the outer periphery of the wheel rim.
10
2. A tyre according to claim 1 wherein the band comprises a rigid band of fixed diameter.
3. A tyre according to claim 2 wherein the rigid band comprises a metal band,
15 ~~adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto~~.
4. A tyre according to claim 1, 2 or 3 further comprising a cushioning structure provided on the band.
5. A tyre according to claim 4 wherein the cushioning structure comprises a
20 resiliently deformable body bonded onto the band.
6. A tyre according to claim 5 wherein the resiliently deformable body incorporates a plurality of cavities separated by load-supporting walls.
7. A tyre according to claim 5 or 6 wherein the resiliently deformable body comprises a unitary mass.
- 25 8. A tyre according to claim 5 or 6 wherein the resiliently deformable body is of composite construction comprising a plurality of layers of material having different characteristics.

9. A tyre according to claim 8 wherein the body comprises an inner layer of higher resilience for cushioning, and an outer layer which is harder and more durable to provide good wear characteristics.
10. A combination of a wheel rim and a tyre, the wheel rim comprising a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, and the tyre comprising a radially inner portion engagable with the wheel rim, ~~the radially inner portion comprising a band adapted to be supportingly received thereon~~
~~on, and releasably fixed with respect to, the outer periphery of the wheel rim~~
~~the radially inner portion comprising a band adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.~~
11. A combination according to claim 10 wherein the band comprises a metal band ~~of fixed diameter~~ ~~adapted to be releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.~~
12. A combination according to claim 11 wherein the welding comprises welding, at circumferentially spaced intervals around the band.
13. A wheel rim and tyre assembly, wherein the wheel rim comprises a tyre support surface incorporating a bead seat on each side of the rim, each bead seat comprising an inner seat portion and an outer seat portion terminating in an arcuate portion defining the outer periphery of the wheel rim, and wherein the tyre comprises a radially inner portion engaged with the wheel rim, the radially inner portion comprising a rigid band supportingly received on, and releasably fixed with respect to, the outer periphery of the wheel rim, ~~the band being releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.~~
14. A wheel rim and tyre assembly according to claim 13 wherein the band comprises a metal band ~~of fixed diameter~~, ~~releasably fixed with respect to the outer periphery of the wheel rim by being welded thereto.~~
15. A wheel rim and tyre assembly according to claim 14 wherein the welding comprises welding at circumferentially spaced intervals around the band.

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16. A tyre substantially as herein described with reference to the accompanying drawings.
17. A combination of a wheel rim and a tyre substantially as herein described with reference to the accompanying drawings.
- 5 18. A wheel rim and tyre assembly substantially as herein described with reference to the accompanying drawings.